

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-24 canceled.

Claim 25 (new): A disinfection apparatus for disinfection of wastewater and/or potable water, the disinfection apparatus comprising:

an electrolytic flow cell including at least two spaced apart electrodes positioned in a flow line of a dynamic flow system which operates at high flow rates in large pipes and open channels through which wastewater and/or potable water passes therethrough;

a DC power supply coupled to a polarity switching circuit and connected to said electrodes, said power supply operable to create an ionic current flow between said electrodes and operable to create a current density for disinfection of the wastewater and/or potable water;

an ultrasonic generator coupled to said electrodes;

an on-line microbial fluorometric monitor coupled to the input and output of said flow cell with sensors in said flow line to detect and quantify the total microbial population density of said wastewater and/or potable water;

a flow meter coupled to said flow line; and

a power supply controller coupled to said power supply and receiving inputs from said on-line microbial fluorometric monitor and said flow meter for adjusting the power output level of said power supply, minimizing electric power consumption.

Claim 26 (new): The disinfection apparatus of claim 25 wherein said electrodes have contact surfaces formed of material selected from a group consisting of iron, iron alloy, stainless steel, carbon and copper.

Claim 27 (new): The disinfection apparatus of claim 25 wherein said power supply provides voltages in the range of 1-200 volts and establishes currents in the range of 1-6 amperes.

Claim 28 (new): The disinfection apparatus of claim 1 wherein said power supply provides current densities in the range of 0.2-200.0 ma/cm².

Claim 29 (new): The disinfection apparatus of claim 25 wherein said wastewater and /or potable water contains oxygen and said ionic current flow generates hydrogen peroxide in said wastewater and/or potable water.

Claim 30 (new): The disinfection apparatus of claim 25 wherein said ultrasonic generator is a low frequency ultrasonic transducer coupled to said electrodes to sonicate said electrodes and said wastewater and/or potable water.

Claim 31 (new): The disinfection apparatus of claim 30 wherein said ultrasonic transducer operates within the range of 15 kHz to 50 kHz.

Claim 32 (new): The disinfection apparatus of claim 30 wherein said ultrasonic transducer is an ultrasonic piezoelectric converter coupled to said electrodes.

Claim 33 (new): The disinfection apparatus of claim 25 wherein said electrodes are opposed extended sheet electrodes mounted in aligned spaced relation to define spaced walls of a

pipe or an open channel with said wastewater and/or potable water flowing between said electrodes.

Claim 34 (new): The disinfection apparatus of claim 25 wherein said power supply connected to said electrodes generates hydrogen peroxide in said wastewater and/or potable water.

Claim 35 (new): The disinfection apparatus of claim 25 wherein said power supply connected to said electrodes generates hydroxyl radicals in said wastewater and/or potable water.

Claim 36 (new): The disinfection apparatus of claim 25 wherein said electrodes are made of copper with the flow cell length in accordance with a specified ionic copper concentration to maintain the copper ion concentration in said wastewater and/or potable water within predetermined regulatory limits.

Claim 37 (new): The disinfection apparatus of claim 25 wherein said electrodes are formed of copper having a length for establishing an extended contact time to said power supply for establishing a lower current density and thereby a low copper concentration in said wastewater and/or potable water within predetermined regulatory limits.

Claim 38 (new): The disinfection apparatus of claim 37 further comprising a monitoring means for monitoring the level of copper concentration in said wastewater and/or potable water passing through said electrodes.

Claim 39 (new): The disinfection apparatus of claim 25 wherein said power supply is a switched bipolar DC power supply.

Claim 40 (new): The disinfection apparatus of claim 25 wherein said switching circuit provides for alternating polarity potential created between said electrodes.

Claim 41 (new): The disinfection apparatus of claim 25 wherein the polarity of said DC power supply is switched at a certain frequency.

Claim 42 (new): The disinfection apparatus of claim 25 wherein said electrodes conform to the shape of said flow line and constitute outer walls of said flow line with said wastewater and/or potable water flowing through said flow cell engaging and filling the space between said electrodes.

Claim 43 (new): The disinfection apparatus of claim 25 wherein said electrodes have a length in the flow direction determined by the flow rate of the wastewater and/or potable and the conductivity of said wastewater and/or potable water.

Claim 44 (new): The disinfection apparatus of claim 25 wherein said power supply establishes a potential at said electrodes for establishing a current density in said wastewater and/or potable water sufficient to reduce the microbial population to a specified level.

Claim 45 (new): The disinfection apparatus of claim 44 wherein said specified level is at least 200 colony forming units (CFUs)/100 ml for wastewater.

Claim 46 (new): The disinfection apparatus of claim 44 wherein said specified level is at least 1 CFU/100 ml for potable water.

Claim 47 (new): The disinfection apparatus of claim 25 wherein said wastewater and/or potable water is treated at a rate as high as 100 million gallons per day in pipe diameters or channel widths as large as 8 feet.

Claim 48 (new): An electroionic disinfection apparatus for disinfecting water including wastewater and/or potable water, the electroionic disinfection apparatus comprising:

an electroionic flow cell including at least two spaced apart electrodes positioned in a flow line including a pipe or open channel through which said water passes therethrough;

a DC power supply coupled to a polarity switching circuit and connected to said electrodes;

an ultrasonic generator coupled to said electrodes;

an on-line microbial fluorometric monitor coupled to the input and output of said flow cell with sensors in said flow line;

a flow meter coupled to said flow line; and

a power supply controller coupled to said power supply and receiving inputs from said on-line microbial fluorometric monitor and said flow meter.

Claim 49 (new): The electroionic disinfection apparatus of claim 48 wherein said power supply creates an ionic current flow between said electrodes and creates a current density for disinfection of said water.

Claim 50 (new): The electroionic disinfection apparatus of claim 48 wherein said on-line microbial fluorometric monitor detects and quantifies the total microbial population density of said water.

Claim 51 (new): The electroionic disinfection apparatus of claim 48 wherein said power supply controller adjusts the power output level of said power supply, minimizing electric power consumption.

Claim 52 (new): The electroionic disinfection apparatus of claim 48 wherein said power supply connected to said electrodes generates hydrogen peroxide in said water.

Claim 53 (new): The electroionic disinfection apparatus of claim 48 wherein said power supply connected to said electrodes generates hydroxyl radicals in said water.

Claim 54 (new): A method for electroionically disinfecting water including wastewater and potable water, the method comprising the steps of:

passing said water through a passageway having opposed electrodes forming opposed outer walls of said passageway;

supplying a switched bipolar DC voltage across said electrodes for establishing a current flow between said electrodes;

connecting an ultrasonic generator to said electrodes;

connecting an on-line microbial fluorometric monitor between the input and output of said passageway;

connecting a flow meter to said passageway; and

coupling a power supply controller to said power supply and receiving inputs from said on-line microbial fluorometric monitor and said flow meter.

Claim 55 (new): The electroionic disinfection apparatus of claim 54 wherein said step of connecting an ultrasonic generator to said electrodes sonicates said electrodes and said water.

Claim 56 (new): The method for electroionically disinfecting water of claim 54 wherein said step of connecting said on-line microbial fluorometric monitor between the input and output of said passageway detects and quantifies the total microbial population density of said water.

Claim 57 (new): The method for electroionically disinfecting water of claim 54 wherein said step of coupling said power supply controller to said power supply and receiving inputs from said on-line microbial fluorometric monitor and said flow meter said power supply controller adjusts the power output level of said power supply, minimizing electric power consumption.

Claim 58 (new): The method for electroionically disinfecting water of claim 54 further comprising the step of generating hydrogen peroxide in said water.

Claim 59 (new): The method for electroionically disinfecting water of claim 54 further comprising the step of generating hydroxyl radicals in said water.